

Applicant: Jacob et al.
Application No.: 09/763,980

REMARKS

Claim 1 is currently pending in this application. By this Reply, claim 1 has been amended to incorporate the subject matter of claim 6 and to specify that each bearing race consists only of one shoulder, as argued in the last Reply. No new matter has been introduced into the application by these amendments

Claims 1 were rejected under 35 U.S.C. §103 as unpatentable over U.S. Patent 2,135,477 to Griswold in view of U.S. Patent 4,699,527 to Hutzel. Griswold is cited as disclosing a differential having a bevel-pinion shaft supported by two angular-contact ball bearings. The Examiner admits that Griswold does not disclose the bearings as double-row bearings and cites Hutzel as disclosing similar angular-contact bearings with a double row construction. Applicants respectfully traverse this rejection.

Claim 1 recites a differential for a motor vehicle having a bevel-pinion shaft supported by two spaced and axially pretensioned angular contact ball bearings, with the angular contact ball bearings being unilaterally loadable double-row tandem angular-contact ball bearings. Each of the two angular-contact ball bearings (16, 17) include shoulders (20, 21) and each race consists of a single shoulder.

Griswold discloses a differential with two spaced and axially loadable single row ball bearings. As admitted in the Action, there is no disclosure of double-row tandem angular-contact ball bearings.

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Hutzel discloses a double-row, angular contact ball bearing. However, as described in the specification at column 5, lines 36-43, and shown in Figure 10, the ball track 37 of Hutzel is bounded on both sides by high rims 38, which both increases cost of manufacture and changes the pressure angle and load distribution since the balls are trapped by the high rims 38 of the outer track 37. The smaller diameter ball track is bounded only on one side. If such bearings were arranged in a differential according to the present invention and pre-tensioned by tightening the threaded piece 11 so that the bevel-pinion shaft 5 is pulled to the left (as shown in Figure 2 of the present application), more of the axial pretension load would be carried in the outer, larger diameter track due to the trapped balls between the high rims 38. While some load would certainly be carried to the smaller diameter tracks and the balls located therein, this would create an uneven loading. In order to clearly differentiate the present invention from Hutzel, Applicants have amended the claim to specifically require that each race consists of a single shoulder.

In addition, the arrangement as now recited in claim 1 further includes the deformable sleeve located between the two bearings. This is also not shown in Griswold or Hutzel.

Accordingly, withdrawal of the section 103 rejection of claim 1 is respectfully requested.

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Claim 6 was rejected under 35 U.S.C. §103 as unpatentable over Griswold in view of Huztel, further in view of De 35 22 600 to Ebert. Applicants respectfully traverse this rejection. To the extent that claim 6 has been canceled, this rejection will be addressed with respect to claim 1.

Claim 1 recites that the inner ring of the second bearing (17) in the arrangement of the invention is supported in an axial direction against a deformable sleeve.

While Ebert shows a deformable sleeve (9) in connection with a known differential arrangement using tapered roller bearings, Ebert does not cure the deficiencies with respect to the combination of Griswold and Hutzel. Therefore, claim 1 should be patentable over this combination for the same reasons as noted above. Accordingly, withdrawal of this section 103 rejection is respectfully requested.

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

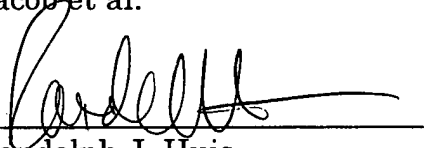
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In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claim 1, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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